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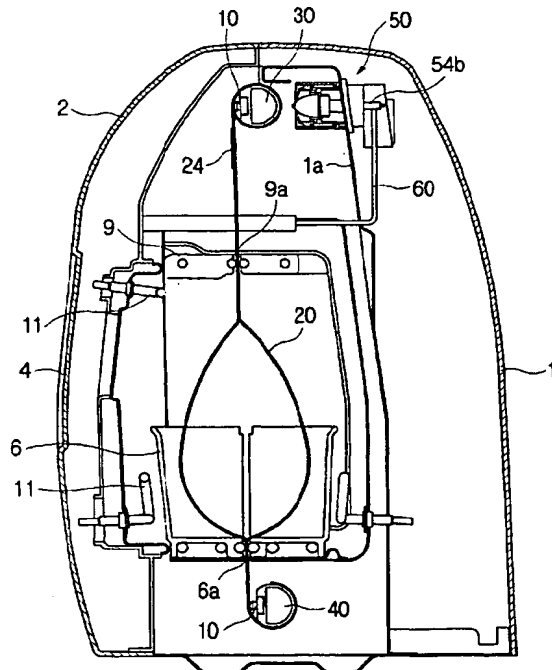
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(54) **Bar code reader and bread maker**

(57) A bread maker includes upper and lower rollers (30, 40; 30A) and a bar code scanner (50). The upper and lower rollers (30, 40; 30A) wind a mixing bag (20) containing bread ingredients to form dough. The bar code scanner (50) reads a bar code (24) attached to the mixing bag (20) so that, as the mixing bag is wound by rotation of the upper and lower rollers (30, 40; 30A), the bar code scanner (50) reads the bar code (24) while being in contact with the bar code (24) wound around one of the upper and lower rollers (30, 40; 30A). The rollers (30, 40; 30A) include flat and arcuate portions. The flat portion of the upper roller (30; 30A) is provided with an arcuate guide section (37) to form a circular track together with the arcuate portion.

FIG. 5



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## Description

**[0001]** The present invention relates to a bar code reader for reading a bar code extending longitudinally on a web, the reader comprising spindle having gripping means for gripping the leading edge of a web for winding of the web onto the spindle by rotation thereof and a bar code reading head for sensing a longitudinal bar code on a web as the web is wound onto the spindle. The present invention also relates to a bread maker comprising first and second spindles for scrolling a mixing bag, containing bread ingredients, back and forth to form dough and a bar code reader for reading a bar code on a mixing bag as the mixing bag is wound onto one of the spindles.

**[0002]** A bread maker is an apparatus that makes bread using a mixing bag containing bread ingredients. The bread maker automatically makes a variety of breads depending on types of bread ingredients.

**[0003]** Figure 1 is a perspective view of a conventional bread maker. As shown, the conventional bread maker includes a housing 1, defining the general appearance of the bread maker, and a door 2 mounted to the front of the housing 1. A display 3 is provided on the front of the housing 1 to provide information to a user visually. Other parts used to make bread are mounted in the housing 1. A window 4 is formed in the door 2 to allow the user to see into the housing 1.

**[0004]** Figure 2 is a perspective view showing the internal structure of the conventional bread maker. As shown in Figure 2, the internal structure of the bread maker includes a pair of opposed, spaced frame members 5. A baking tray 6, upper and lower rollers 7, 8 and a squeezer 9 are interposed between the frame members 5. Additionally, a pair of heaters 11 are mounted to an inner surface of the door 2 to bake bread ingredients in a form of dough with appropriately supplied heat.

**[0005]** The baking tray 6 forms a bread making space to accommodate a mixing bag 20 (see Figure 3). The upper and lower rollers 7, 8, respectively, hold the upper and lower ends of the mixing bag 20 to allow the mixing bag 20 to be raised and lowered so as to mix the bread ingredients and form dough. In order to help the upper and lower rollers 7, 8 hold the mixing bag 20, a plurality of fixing protrusions 10 are formed on each of the upper and lower rollers 7, 8.

**[0006]** A slit 9a is formed in the centre of the squeezer 9 so as to allow an upper portion of the mixing bag 20 to pass therethrough. Accordingly, when the mixing bag 20 is moved upwards by rotation of the upper and lower rollers 7, 8, the mixing bag 20 is drawn through the slit 9a and squeezed so that the bread ingredients are held below the squeezer 9. A slit 6a (see Figure 4) having the same function as that of the slit 9a is formed in the centre of the baking tray 6. Accordingly, when the mixing bag 20 is drawn downwards by the rotation of the upper and lower rollers 7, 8, the mixing bag 20 is move through the slit 6a but the bread ingredients are not allowed to

move downward and remain in the baking tray 6 to form dough.

**[0007]** Figure 3 is a perspective view showing the mixing bag 20 referred to above. As shown in Figure 3, the mixing bag 20 is made of an elastic material, such as vinyl. Dry bread ingredients 21 are contained in the mixing bag 20. An inner bag 22 containing baking liquid is disposed in the mixing bag 20 to be mixed with the dry bread ingredients 21 to form dough. The dry bread ingredients 21 include flour, e.g. wheat flour, that is a principle material of bread. The inner bag 22 is ruptured when the mixing bag 20 is drawn through the slit 9a (see Figure 2) in the squeezer 9, so that the baking liquid is mixed with the dry bread ingredients 21.

**[0008]** A plurality of fixing holes 23 are formed in the upper and lower portions of the mixing bag 20 to receive the fixing protrusions 10, thereby allowing the mixing bag 20 to be held by the upper and lower rollers 7, 8. Additionally, a bar code 24 is attached to the mixing bag 20. The bar code 24 provides bread making information including material mixing time, roller rotating speed, leavening time and temperature, baking time and temperature, etc.

**[0009]** Figure 4 is a sectional view showing the state in which the bar code 24 is read by the conventional bar code scanner 25 while the mixing bag 20 is held by the upper and lower rollers 7, 8. As shown in Figure 4, the mixing bag 20 is tightly held in such a way that the dry bread ingredients 21 contained in the mixing bag 20 are positioned in the baking tray 6, the upper and lower portions of the mixing bag 20 are passed through the slit 9a of the squeezer 9 and the slit 6a of the baking tray 6 and the fixing holes 23 formed in the mixing bag 20 are fitted on to the fixing projections 10 formed on the upper and lower rollers 7, 8.

**[0010]** A conventional bar code scanner 25, configured to read the bar code 24 attached to the mixing bag 20, is positioned to be opposite to the upper roller 7 and spaced apart from the mixing bag 20 by a certain distance so as to face the bar code 24 attached to the mixing bag 20. Accordingly, before bread making starts, the bar code scanner 25 is activated and reads the bar code 24 attached to the mixing bag 20. That is, when the upper and lower rollers 7, 8 are slowly rotated in a forward direction (in Figure 4, in a clockwise direction), the upper portion of the mixing bag 20 is wound around the upper roller 7, and the bar code 24 attached to a surface of the mixing bag 20 is passed by the bar code scanner 25. The bar code scanner 25 reads bread making information from the bar code 24.

**[0011]** Thereafter, in accordance with the bread making information read by the bar code scanner 25, the upper and lower rollers 7, 8 are rotated alternately in forward and reverse directions to form dough and the heaters 11 are operated to bake the dough disposed on the baking tray 6.

**[0012]** However, in the conventional bread maker, the conventional bar code scanner 25 reads the bar code

24 in a non-contact way while spaced apart from the bar code 24. Additionally, the bar code 24 is attached to a mixing bag 20 which is made of an elastic material. Thus, the mixing bag 20 is not flat but wrinkled when being moved upwards by the rotation of the upper roller, thereby hindering the bar code scanner 25 from correctly reading the bar code 24. As a result, bread making is not correctly performed due to an inaccurate reading of the bar code 24, adversely affecting the reliability of the bread maker.

**[0013]** A bar code reader according to the present invention is characterised in that the bar code reading head contacts the web for reading a bar code thereon.

**[0014]** Preferably, the spindle comprises a platen portion aligned with the bar code reading head. More preferably, the platen portion extends completely around the spindle and/or the platen portion has a circumferentially extending groove aligned with the bar code reading head. The platen may have an outer shock absorbing layer.

**[0015]** Preferably, the gripping means comprises an axial row of projections on the spindle for being received through corresponding holes at the leading edge of a web to be wound onto the spindle. More preferably, the spindle has a generally D-shaped cross-section except for the platen portion which has a circular cross-section and the projections are located on the flat of the spindle.

**[0016]** A bread maker according to the present invention is characterised in that the bar code reader is a bar code reader according to the present invention.

**[0017]** A bread maker according to the present invention preferably includes a housing, having a door to provide access for attaching a mixing bag to the spindles, and actuating means for moving the bar code reading head in dependence on the position of the door such that opening the door brings the head into a bar code reading position and closing the door moves the head away from the spindle comprised in the bar code reader. More preferably, the actuating means comprises a mechanical linkage.

**[0018]** Preferably, the first spindle is above the second spindle and the bar code reader comprises the first spindle.

**[0019]** Embodiments of the present invention will now be described, by way of example, with reference to Figures 3 and 5 to 13 of the accompanying drawings, in which:-

Figure 1 is a perspective view of a conventional bread maker;

Figure 2 is a perspective view showing the internal construction of the conventional bread maker shown in Figure 1;

Figure 3 is a perspective view of a mixing bag containing bread ingredients;

Figure 4 is a sectional view of a conventional bread maker with a conventional bar code scanner;

Figure 5 is a sectional view showing a bread maker,

according to the present invention with a bar code scanner with its door closed;

Figure 6 is a sectional view of the bread maker of Figure 5 with its door open;

5 Figure 7 is an exploded perspective view of a bar code scanner of the present invention used in the bread maker shown in Figure 5;

Figure 8 is a sectional view of the bar code scanner of Figure 7;

10 Figure 9 is a perspective view showing an upper roller and the bar code scanner in contact with the upper roller;

Figures 10A and 10B are sectional views taken along line X-X of Figure 9, in which Figure 10A shows the mixing bag with a bar code in contact with the upper roller before it starts to rotate, and Figure 10B is a view shows the bar code, attached to the mixing bag, in contact with the bar code scanner;

15 Figure 11 is a view corresponding to Figure 9 showing the upper roller and the bar code scanner in contact with the upper roller of another embodiment of the present invention;

Figure 12 is a partial sectional view of Figure 11 showing a function of a groove formed around a roller;

20 Figure 13 is an enlarged view of portion "A" of Figure 12.

**[0020]** Referring to Figures 5 and 6, the bread maker includes a housing 1 and a door 2. In the housing 1, bread making is carried out. The door 2 provides through the front of the housing 1 and has a plurality of heaters 11 mounted to its inside surface. A baking tray 6, a squeezer 9, an upper roller 30, a lower roller 40 and a bar code scanner 50 are provided in the housing 1. The squeezer 9 is disposed over the baking tray 6. The upper roller 30 is rotatably positioned over the squeezer 9, while the lower roller 40 is rotatably positioned under the baking tray 6. The bar code scanner 50 is disposed to be brought into contact with the upper roller 30.

**[0021]** An upper portion of a mixing bag 20, which contains bread ingredients and to whose upper surface a bar code is attached, is inserted through a slit 9a formed in along the centre of the squeezer 9. A lower portion of the mixing bag 20 is inserted through a slit 6a formed along the centre of the baking tray 6. Additionally, upper and lower ends of the mixing bag 20 are held by the upper and lower rollers 30, 40. The upper and lower rollers 30, 40 are rotated in both forward and reverse directions by the action of a belt that is rotated by a motor (not shown).

**[0022]** The bar code scanner 50 is fixedly attached to a rear plate 1a positioned in a rear portion of the interior of the housing 1 such that it can be selectively brought into contact with and removed from the upper roller 30 by the action of a lever 60. The lever 60 is operated in conjunction with an operation of the door 2. The bar code scanner 50 may thereby be brought into contact

with the bar code 24 by the rotation of the upper and lower rollers 30, 40 in the forward direction.

**[0023]** As shown in Figure 5, when the door 2 is closed, the lever 60 is moved rearward together with the door 2 to remove the bar code scanner 50 from the upper roller 30. On the other hand, as shown in Figure 6, when the door 2 is opened, the lever 60 having an elastic restoring force is restored to its original position to bring the bar code scanner 50 into contact with the upper roller 30.

**[0024]** With the above-described construction, as the upper roller 30 is slowly rotated in the forward direction while the bar code scanner 50 is in contact with the upper roller 30, i.e. with the door 2 open as shown in Figure 6, the bar code scanner 50 reads the bar code 24 (see Figure 3) attached to the mixing bag 20. When the door 2 is closed after the bar code reading operation is complete, dough is formed by the rotation of the upper and lower rollers 30, 40 in both the forward and reverse directions with the bar code scanner 50 removed from the upper roller 30 as shown in Figure 3.

**[0025]** Referring to Figure 7, the bar code scanner 50 includes a bar code reader 51, a holder 52, a bracket 53 and a cover 54. The bar code reader 51 is provided at its front end with a tip 51a that is brought into contact with the bar code 24. The holder 52 has a hollow cylindrical shape, and accommodates and supports the bar code reader 51. The bracket 52 has a hollow cylindrical shape, and accommodates the holder 52 so that it is longitudinally movable by a certain distance therein. The cover 54 is interlocked with a rear end of the holder 52 to protect a rear end portion of the bar code reader 51.

**[0026]** A pair of locking holes 52a are formed in the rear end of the holder 52 and a pair of locking projections 54a are formed on a front end of the cover 54 for being interlocked with the locking holes 52a, thereby uniting the cover 54 with the holder 52. A plurality of screw holes 53a are formed in the rear end of the bracket 53, so screws (not shown) are tightened into the rear plate 1a (see Figure 5) through the screw holes 53a, thus allowing the bar code scanner 50 to be fixedly attached to the rear plate 1a.

**[0027]** A coil spring 55 is interposed between the bracket 53 and the holder 52, inserted into the bracket 53, so that the holder 52 accommodating the bar code reader 51 is biased toward the upper roller 30 by the action of the coil spring 55 with the bracket 53 fixedly attached to the rear plate 1a. Thus, the tip 51a of the bar code reader 51 is maintained in contact with the upper roller 30 when the door 2 is open.

**[0028]** A guide cap 56 is mounted on a front end of the holder 52 to guide the upper end of the mixing bag 20 smoothly to the tip 51a of the bar code reader 51 when the mixing bag 20 is wound around the upper roller 30. The front surface of the guide cap 56 is convex and projects forward to form a guide surface 56a and is provided at its centre with a hole 56b to allow the tip 51a of the bar code reader 51 to project forward. The guide sur-

face 56a has a certain curvature to allow the upper end of the mixing bag 20 to be wound around the upper roller 30 without being caught by the guide surface 56a. The guide surface 56a does not hinder the winding of the mixing bag 20. An internally threaded portion (not shown) is formed on the rear end of the guide cap 56 receiving an externally threaded portion 52b, formed on the front end of the holder 52, to unite the guide cap 56 with the holder 52. A lever stopper 54b is formed on a side of the cover 54 to hold a rear end of the lever 60 shown in Figures 5 and 6 so that the cover 54 and the holder 52 are longitudinally moved by the lever 60 operated in conjunction with the door 2 with the bracket 53 kept stationary.

**[0029]** As shown in Figure 8, in the bar code scanner 50, the bracket 53 is fixedly attached to the rear plate 1a by screws. The holder 52, united at its rear end with the cover 54, is inserted into the bracket 53 with the coil spring 55 disposed around its outer surface. Also, in the bar code scanner 50, the externally threaded portion 52b, formed on the front end of the holder 52, is engaged with the internally threaded portion formed on the rear end of the guide cap 56.

**[0030]** In a state in which the component parts are assembled into the bar code scanner 50, the coil spring 55 is elastically supported by an outward protrusion 56c of the guide cap 56 and an inward protrusion 53b of the bracket 53. Thus, the holder 52 accommodating the bar code reader 51 is biased toward the upper roller 30 by the coil spring 55 to allow the tip 51a of the bar code reader 51 to be brought into tight contact with the upper roller 30. Meanwhile, when rearward force is applied to the cover 54 by the lever 60, the coil spring 55 is compressed while the holder 52 is moved rearward, thereby removing the tip 51a of the bar code reader 51 from the upper roller 30.

**[0031]** Referring to Figure 9, the upper roller 30 includes a first member 31 and a second member 33. The first member 31 has an arcuate portion 32. The second member 33 is fitted into the side of the first member 31 opposite to the arcuate portion 32 to form a flat portion 34. The upper roller 30 generally has a D-shaped section. The first member 31 is made of relatively light metal such as aluminium. The second member 33 is made of synthetic resin and fastened into the first member 31 by screws. A plurality of fixing projections 35 are formed on the second member 33 for insertion into fixing holes 23 formed in the mixing bag 20. However, the upper roller 30 may be fabricated as a single member as long as the same shape and structure are maintained.

**[0032]** An arcuate guide section 36 is formed on part of the flat portion 34 of the second member 33 to form a circular track 37 together with the arcuate portion 32 of the first member 31. The circular track 37 with which the bar code scanner 50 comes in contact is made to be circular by the arcuate guide section 36 and corresponding part of the arcuate portion 32 of the first member 31. With this construction, when the second member

33 is brought into contact with the bar code scanner 50, boundaries of the flat portion 34 are prevented from interfering with contact between the bar code scanner 50 and the upper roller 30.

**[0033]** A thin, elastic pad 38 is attached to the circular track 37 so that the first and second members 31, 33 are prevented from being worn out by direct contact between the first and second members 31, 33 and the tip 51a of the bar code scanner 50. Additionally, the pad 38 absorbs vibration caused by the rotation of the upper roller 30 while the bar code 24 is being read so that the tip 51a of the bar code scanner 50 remains in contact with the circular track 37 without being removed from the circular track 37.

**[0034]** Referring to Figure 10A, when the upper roller 30 stops, the mixing bag 20 is situated in contact with the upper roller 30. Thereafter, when the upper roller 30 is rotated in the forward direction, the upper end of the mixing bag 20 is pulled over the outer surface of the upper roller 30, passed the bar code scanner 50, and wound around the outer surface of the upper roller 30. In this case, the portion of the mixing bag 20 to which the bar code 24 is attached, is moved along and wound around the circular track 37 formed on the upper roller 30. In the course of movement of the mixing bag 20, the upper end of the mixing bag 20 is guided to the tip 51a of the bar code reader 51 by the guide cap 56 so that the bar code 24 is passed by the bar code scanner 50 while being in contact with the bar code scanner 50.

**[0035]** Meanwhile, the upper roller 30 cannot be rotated around its rotational axis in a perfect circle so the upper roller 30 undergoes eccentric rotation, thereby causing slight vibration of the upper roller 30 and, accordingly, hindering the bar code 24 from being correctly read. Additionally, when external impact is applied to the bread maker, the bar code scanner 50 is momentarily taken off the upper roller 30.

**[0036]** In this case, since the pad 38, which absorbs such vibration and impact, is attached to the circular track 37 of the upper roller 30, the bar code 24 is passed through the bar code scanner 50 while being in contact with the bar code scanner 50.

**[0037]** Referring to Figure 11, the upper roller 30A has the same construction as the upper roller 30 shown in Figure 9 except that a circular groove 39 is formed along a centreline of the circular track 37 around which the bar code 24 of the mixing bag 20 is wound. Therefore, only the construction and operation of the circular groove 39 are described herein below.

**[0038]** The circular groove 39 has a certain width and depth and is shaped to form a hollow circular ring in the centreline of the circular track 37. The tip 51a of the bar code scanner 50 is situated at a position opposite to the groove 39. When the door 2 is opened to read the bar code 24 (see Figure 6), the tip 51a of the bar code scanner 50 is situated at a position corresponding to a surface of the circular track 37. Accordingly, the tip 51a of the bar code scanner 50 faces the circular groove 39

while being spaced apart from a surface of the circular groove 39 by the depth of the circular groove 39.

**[0039]** Referring to Figures 12 and 13, when the mixing bag 20 is wound around the upper roller 30A by a rotation of the upper roller 30A, the bar code 24 of the mixing bag 20 is moved along and wound around the circular track 37. Here, the tip 51a of the bar code scanner 50 reads the bar code 24 while being in contact with the bar code 24 and being spaced apart from the circular groove 39 by a certain distance.

**[0040]** As described above, the tip 51a of the bar code scanner 50 reads the bar code 24 while being spaced apart from the upper roller 30A by the circular groove 39. Accordingly, even though vibration caused by the rotation of the upper roller 30A or impact occurs, the bar code scanner 50 is not taken off the bar code 24 and is maintained in tight contact with the bar code 24, thereby stably reading the bar code 24.

**[0041]** For example, the bar code scanner 50 reads the bar code 24 with its tip 51a positioned over the circular groove 39 in the circular track 37. Thus, the bar code scanner 50 is spaced apart from the upper roller 30A by a distance corresponding to the depth of the circular groove 39, and brought into tight contact with the bar code 24. Accordingly, when the vibration of the upper roller 30A or external impact occurs, the mixing bag 20 made of an elastic material is pushed toward the circular groove 39 by the tip 51a of the bar code scanner 50. As the vibration or impact is absorbed by a cushion action of air in the circular groove 39 and a self-elasticity of the mixing bag 20, the tip 51a of the bar code scanner 50 is maintained in tight contact with the bar code 24. In addition, the upper roller 30A is kept spaced apart from the bar code scanner 50 so that wearing of the upper roller 30A does not occur.

**[0042]** Although the bar code 24 is described as being read by the bar code scanner 50 while being wound around the upper roller 30A, the lower roller 40 may be fabricated to have the same construction as that of the above-described upper roller 30A and the bar code scanner 50 may be situated to face the lower roller 40 to obtain the same operational effect.

#### 45 Claims

1. A bar code reader for reading a bar code extending longitudinally on a web, the reader comprising:

50 spindle (30; 30A) having gripping means (35) for gripping the leading edge of a web (20) for winding of the web onto the spindle (30; 30A) by rotation thereof; and  
55 a bar code reading head (50) for sensing a longitudinal bar code (24) on a web (20) as the web (20) is wound onto the spindle (30; 30A),

**characterised in that**

- the bar code reading head (50) contacts the web (20) for reading a bar code thereon (24).
2. A bar code reader according to claim 1, wherein the spindle (30; 30A) comprises a platen portion (37) aligned with the bar code reading head (50). 5
  3. A bar code reader according to claim 2, wherein the platen portion (37) extends completely around the spindle (30; 30A). 10
  4. A bar code reader according to claim 2 or 3, wherein the platen portion (37) has a circumferentially extending groove (39) aligned with the bar code reading head (50). 15
  5. A bar code reader according to any preceding claim, wherein the gripping means (35) comprises an axial row of projections (35) on the spindle (30; 30A) for being received through corresponding holes (23) at the leading edge of a web (20) to be wound onto the spindle (30; 30A). 20
  6. A bar code reader according to claim 5, wherein the spindle (30; 30A) has a generally D-shaped cross-section except for the platen portion (37) which has a circular cross-section and the projections (35) are located on the flat of the spindle (30; 30A). 25
  7. A bread maker comprising first and second spindles (30, 40; 30A) for scrolling a mixing bag (20), containing bread ingredients (21), back and forth to form dough and a bar code reader for reading a bar code (24) on a mixing bag (20) as the mixing bag (20) is wound onto one of the spindles (30; 30A), **characterised in that** the bar code reader is a bar code reader according to any preceding claim. 30
  8. A bread maker according to claim 7, including a housing (1), having a door (2) to provide access for attaching a mixing bag (20) to the spindles (30, 40; 30A), and actuating means (60) for moving the bar code reading head (50) in dependence on the position of the door (2) such that opening the door (2) brings the head (50) into a bar code reading position and closing the door (2) moves the head (50) away from the spindle (30; 30A) comprised in the bar code reader. 40
  9. A bread maker according to claim 8, wherein the actuating means (60) comprises a mechanical linkage. 45
  10. A bread maker according to claim 7, 8 or 9, wherein the first spindle (30; 30A) is above the second spindle (40) and the bar code reader comprises the first spindle (30; 30A). 50
  11. A bread maker, comprising:
    - first and second rollers to wind a mixing bag containing bread ingredients to form dough; and
    - a bar code scanner to read a bar code attached to the mixing bag so that, as the mixing bag is wound by rotation of the upper and lower rollers, the bar code scanner reads the bar code while being in contact with the bar code wound around one of the upper and lower rollers.
  12. The bread maker according to claim 11, wherein the upper roller comprises:
    - flat and arcuate portions, the flat portion being provided with an arcuate guide section to form a circular track together with the arcuate portion so that the bar code is guided along the circular track provided on the upper roller, and brought into contact with and passed through the bar code scanner.
  13. The bread maker according to claim 12, further comprising:
    - a pad attached to the circular track to prevent wearing of the circular track caused by contact with a front end of the bar code scanner, and to absorb vibration caused by rotation of the upper roller so that smooth contact is allowed between the bar code and the bar code scanner.
  14. The bread maker according to claim 12, wherein the circular track is provided with a ring-shaped groove so that the bar code is brought into contact with the bar code scanner while being spaced apart from the upper roller by the ring-shaped groove.
  15. The bread maker according to claim 12, wherein the bar code scanner comprises:
    - a bar code reader to read the bar code, the bar code reader being provided at a front end thereof with a tip to be brought into point contact with the bar code.
  16. The bread maker according to claim 15, wherein the bar code scanner further comprises:
    - a holder having a hollow cylindrical shape, to accommodate and support the bar code reader; and
    - a bracket having a hollow cylindrical shape, to accommodate the holder to be longitudinally moved a certain distance therein.
  17. The bread maker according to claim 16, wherein the

bar code scanner further comprises:

a guide cap disposed in front of the bar code reader to guide the bar code to the tip of the bar code reader.

18. The bread maker according to claim 17, wherein the guide cap is screwed on a front end of the holder.

19. The bread maker according to claim 17, further comprising:

a coil spring interposed between the bracket and the holder to bias the bar code so as to be brought into tight contact with the upper roller.

20. The bread maker according to claim 17, wherein the bar code scanner further comprises:

a cover interlocked with a rear end of the holder to protect and surround a rear end portion of the bar code reader.

21. The bread maker according to claim 20, further comprising:

a housing and a door to selectively open and close a front of the housing, wherein the cover is provided at one end thereof with one or more locking projections, and the housing is interlocked at a first end of the housing with the locking projections of the cover and provided at a second end of the housing with a lever to be moved forward and rearward by an operation of the door, thereby allowing the bar code reader to be brought into contact with the upper roller when the door is opened, and taken off the upper roller by rearward moving of the cover caused by the lever when the door is closed.

22. The bread maker according to claim 21, further comprising:

a rear plate in which the bar code scanner is fixedly attached, positioned in a rear portion of an interior of the housing, thereby allowing the bar code scanner to be selectively brought into contact with and removed from the upper roller by the lever.

23. The bread maker according to claim 17, wherein the guide cap is provided with a hole at a center of the guide cap to allow the tip of the bar code reader to be projected forward, and a curved-shaped guide surface formed on a front of the guide cap to allow the mixing bag to wind around the upper roller without being caught by the guide surface.

24. A bread maker, comprising:

a housing and a door, the door selectively opening and closing a front of the housing;  
a plurality of heaters mounted on the door;  
a baking tray and a scraper provided in the housing;

an upper and lower roller to wind a mixing bag containing bread ingredients to form dough;  
and

a bar code scanner to read a bar code attached to the mixing bag so that, as the mixing bag is wound by rotation of the upper and lower rollers, the bar code scanner reads the bar code while being in contact with the bar code wound around one of the upper and lower rollers.

25. The bread maker according to claim 24, wherein one of the upper roller or the lower roller further comprises:

a first member having an arcuate portion and a second member having a flat portion, the flat portion being provided with an arcuate guide section to form a circular track together with the arcuate portion so that the bar code is guided along the circular track, and brought into contact with and passed through the bar code scanner.

26. The bread maker according to claim 25, further comprising:

a vibration and impact absorbing element attached to the circular track to allow the bar code scanner to correctly read the bar code when vibration or impact to the bread maker occurs.

27. The bread maker according to claim 25, wherein the circular track is provided with a circular groove along a centerline of the circular track around which the bar code and the mixing bag is wound.

28. The bread maker according to claim 26, wherein the vibration and impact absorbing element is attached to the circular track to prevent the first and second members from being worn.

FIG. 1  
(PRIOR ART)

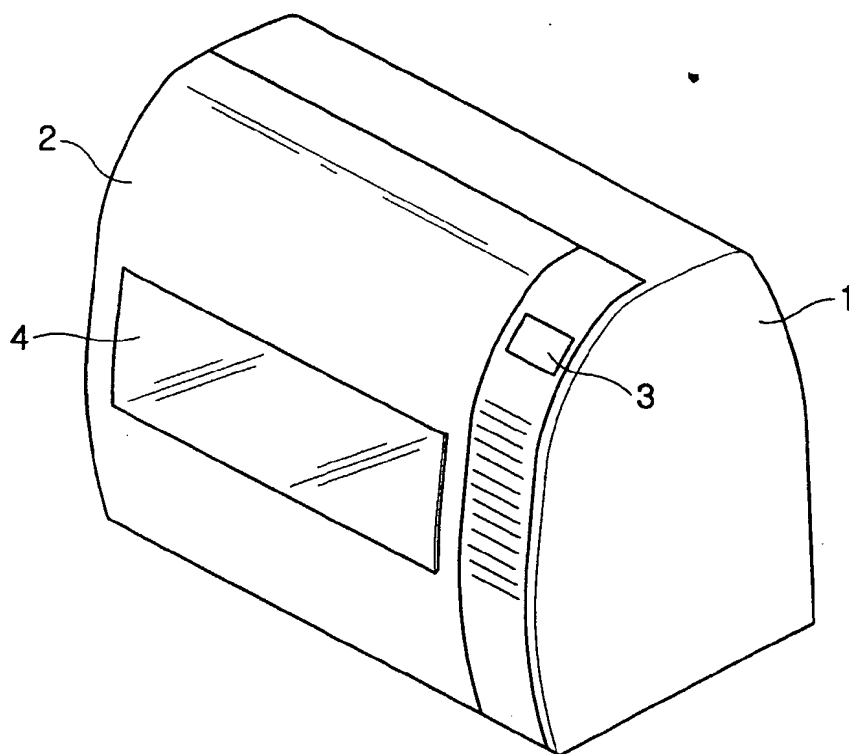




FIG. 2  
(PRIOR ART)

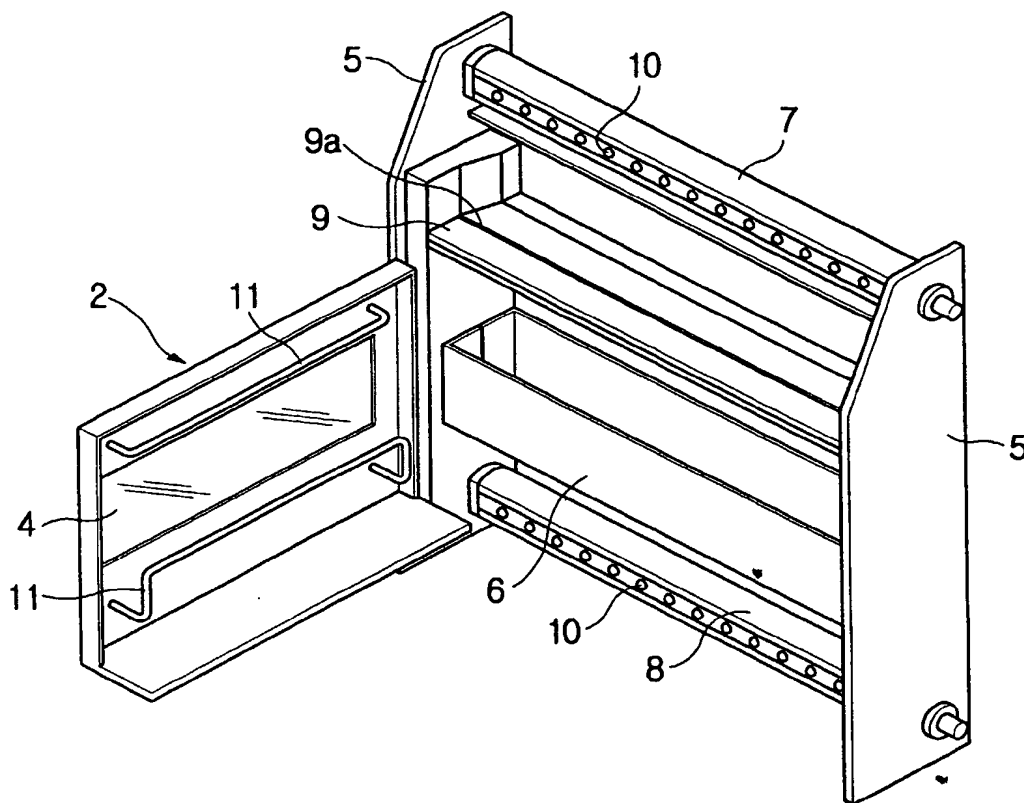


FIG. 3  
(PRIOR ART)

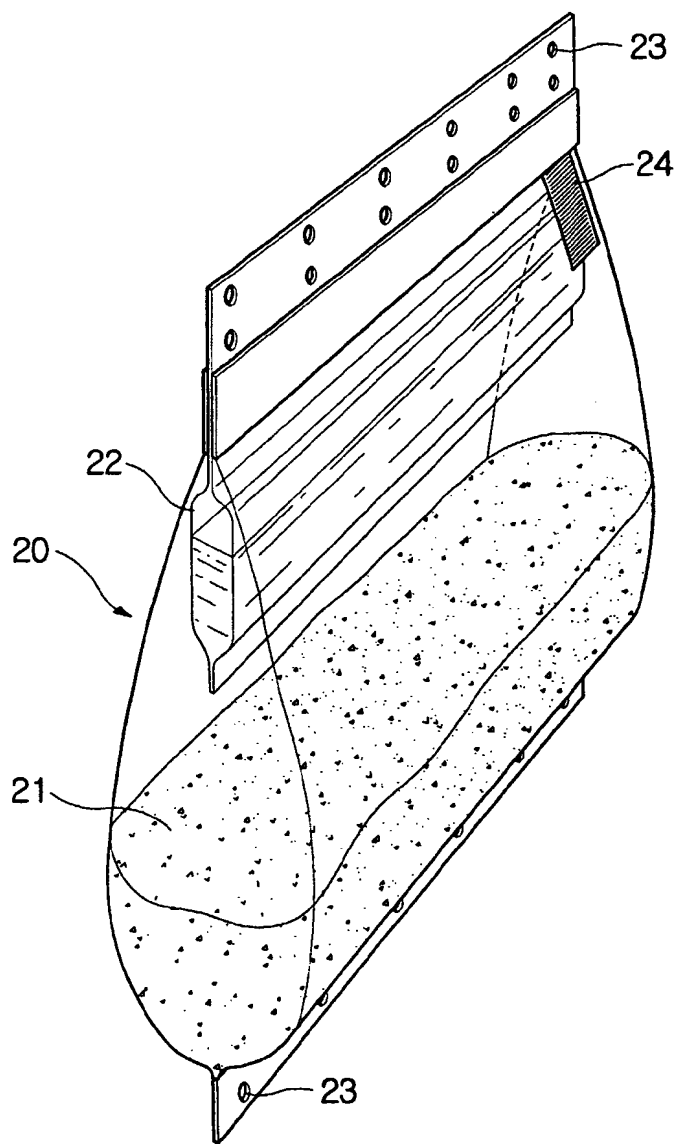


FIG. 4  
(PRIOR ART)

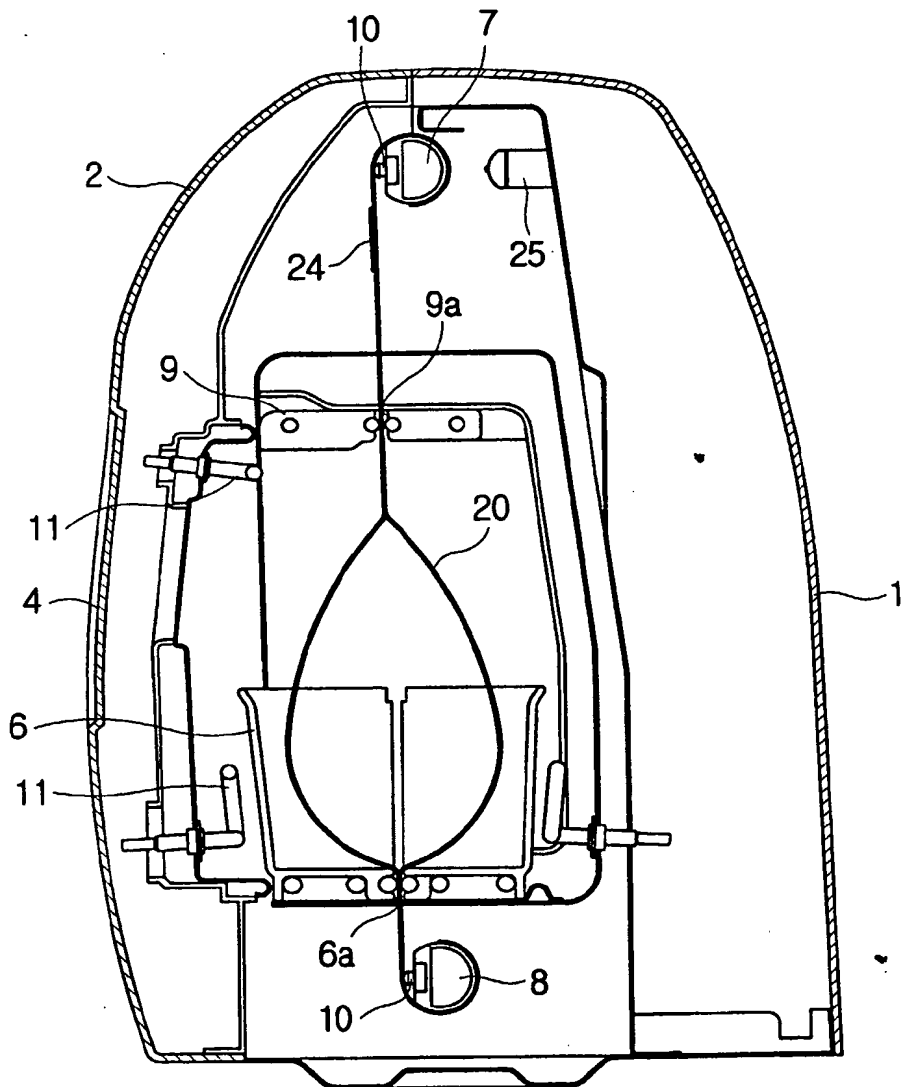


FIG. 5

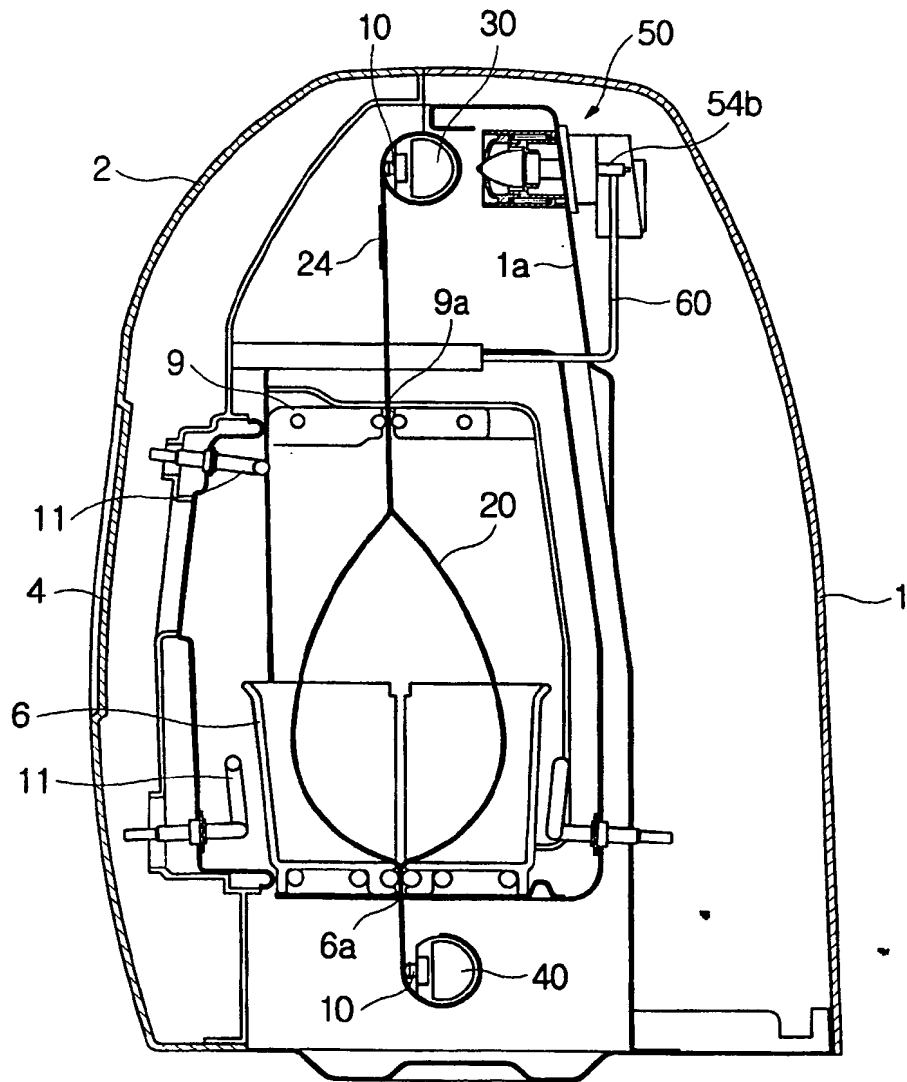
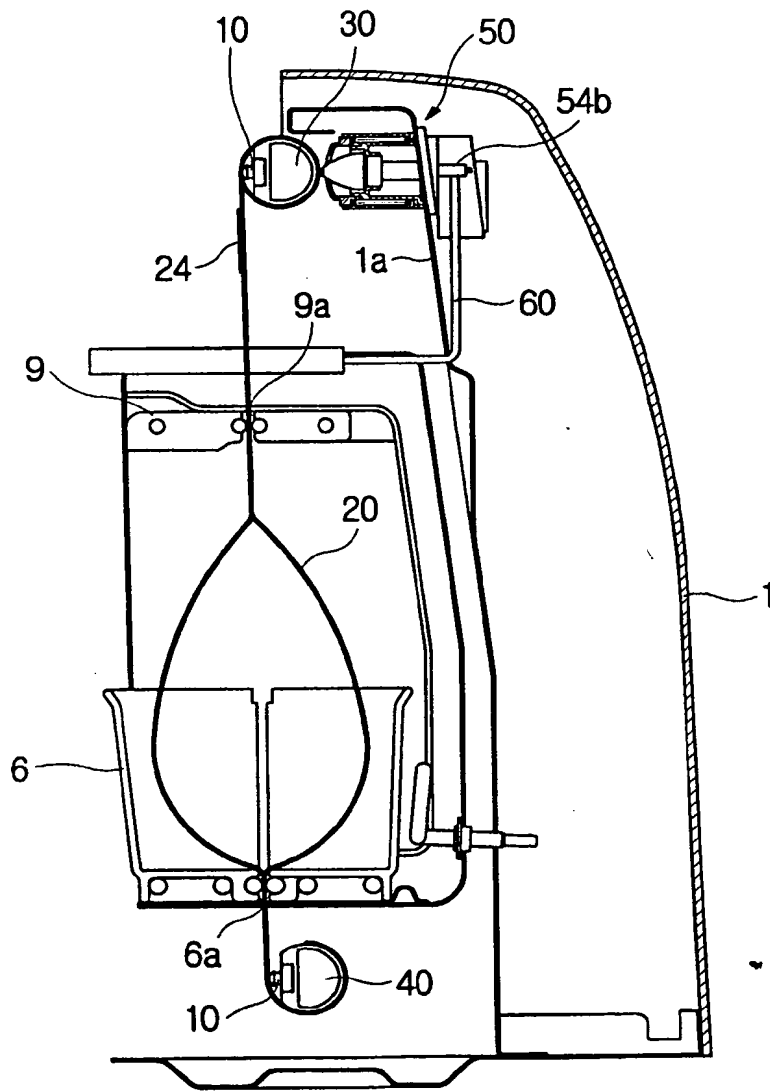


FIG. 6



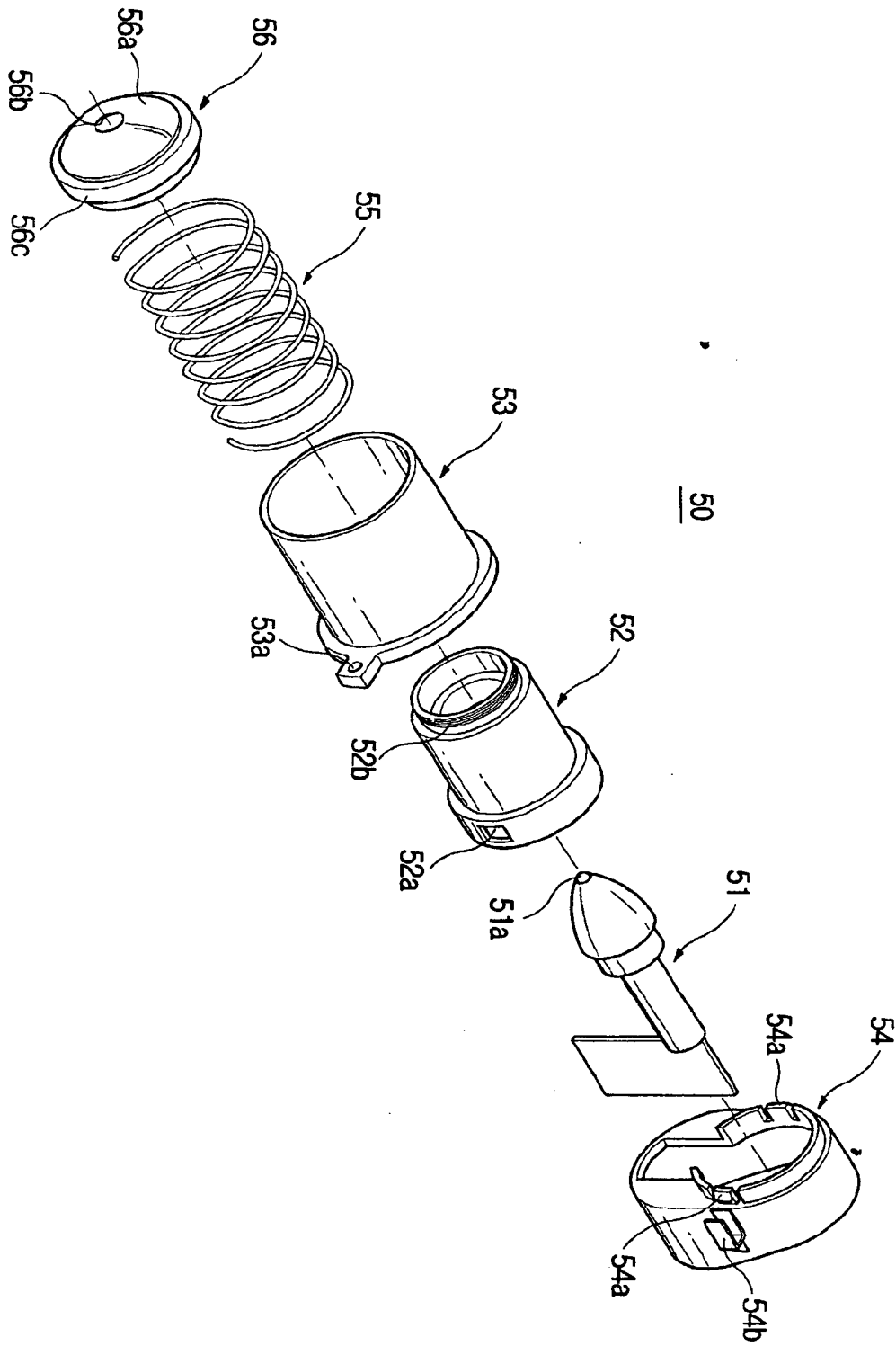


FIG. 7

FIG. 8

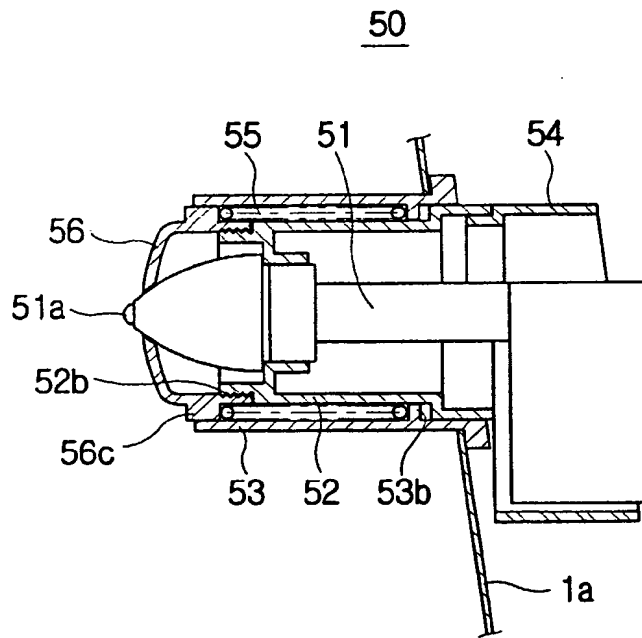


FIG. 9

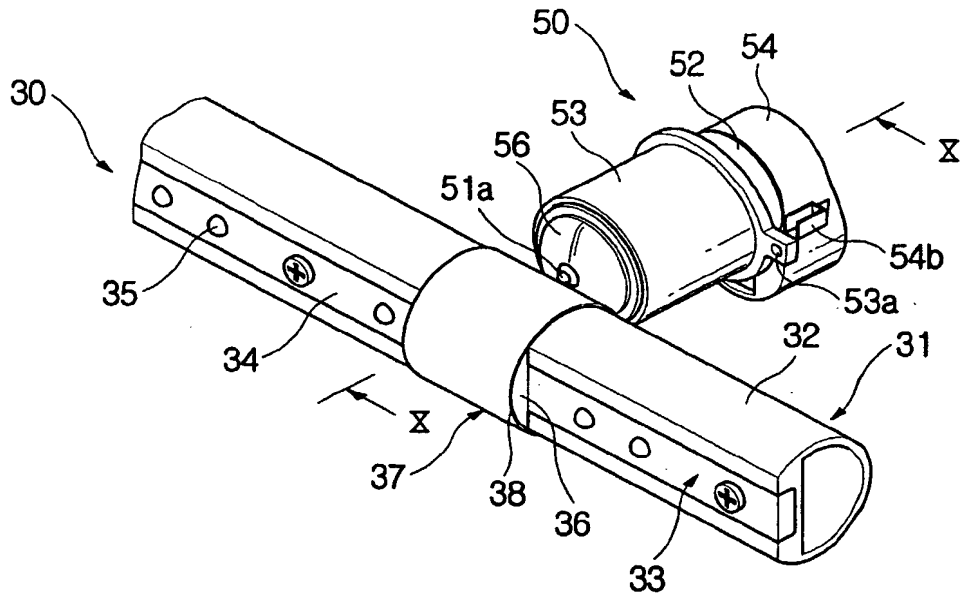




FIG. 10a

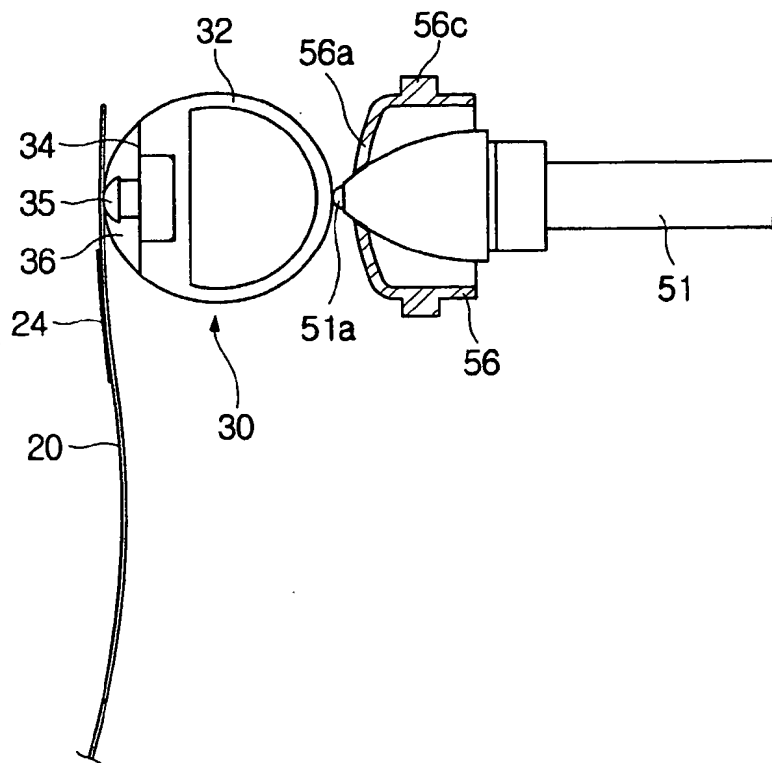


FIG. 10b

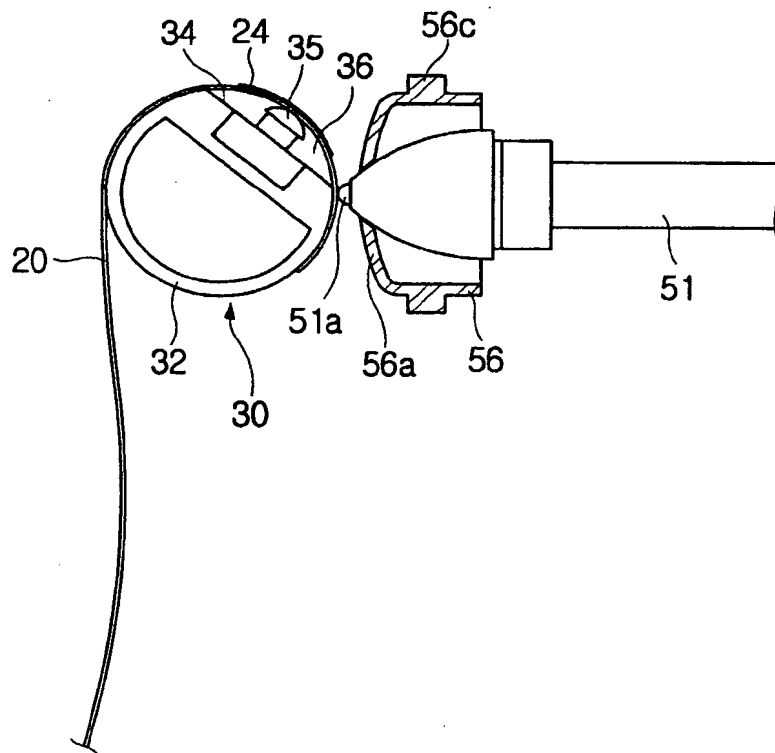


FIG. 11

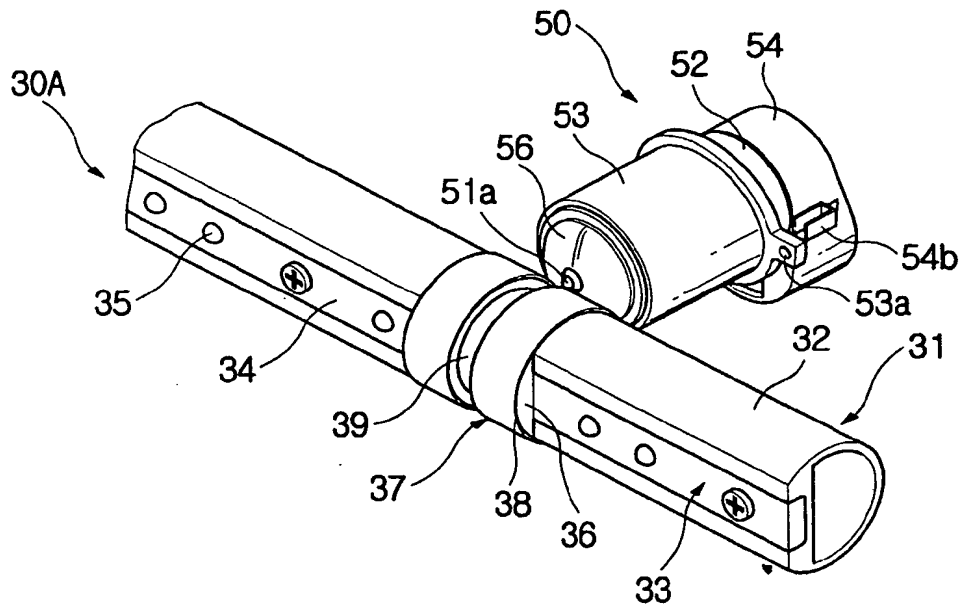


FIG. 12

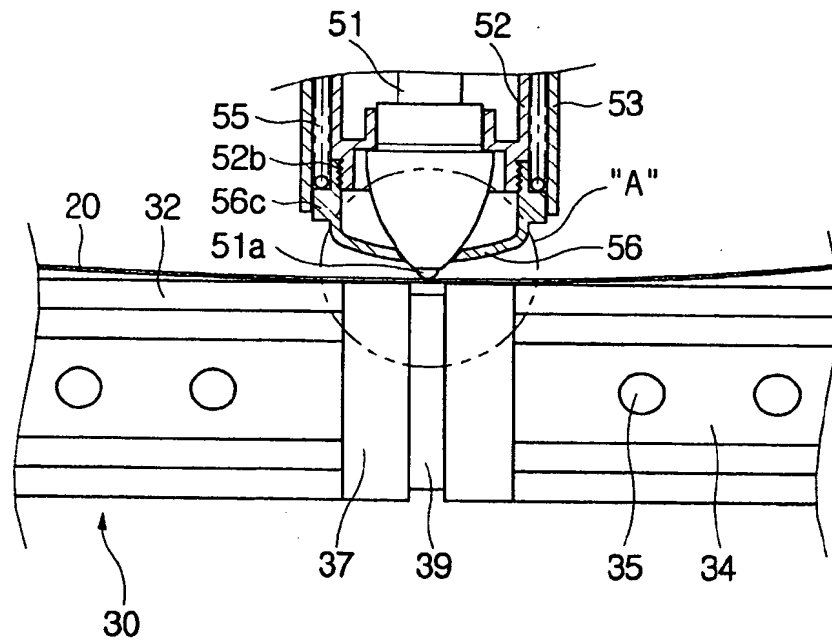
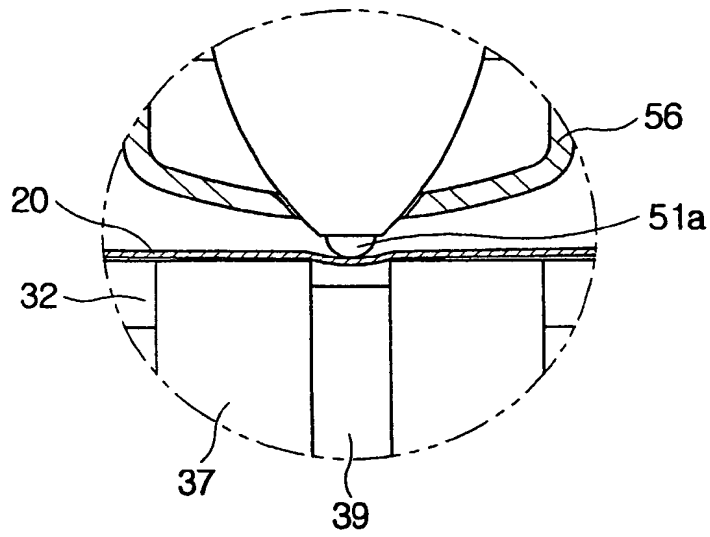


FIG. 13



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